

Dimensionally Stable Membrane for High Pressure Electrolyzers, Phase II

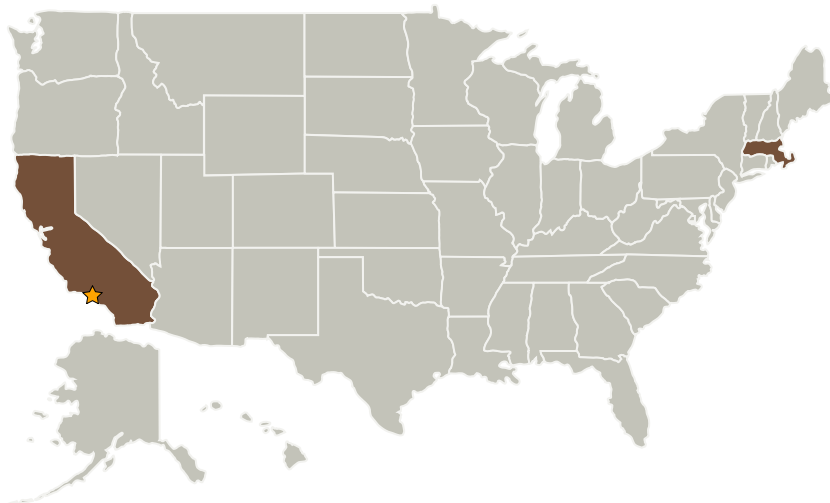
Completed Technology Project (2009 - 2011)



Project Introduction

Utilizing high strength polymers with controlled pore dimensions as a support, a customized membrane electrode assembly (MEA) can be generated for NASA's electrolyzer and fuel cell stacks that has optimized electrochemical performance with greatly improved mechanical properties enabling high pressure (>1000 psi) operation. The overall objective is to optimize DSM-based MEAs for a NASA lunar application. This will be accomplished through six tasks; 1. Extending GES's gas crossover and chemical degradation mitigation strategies to DSMs 2. Improving DSM with better ionomer; 3. Optimize the anode; 4. Optimize DSM MEAs for H₂/O₂ fuel cells. 5. Update GES model for electrolyzer and fuel cell performance. 6. Use model to select optimal DSM for lunar electrolyzer application and generate MEAs for full-size stack.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Giner Electrochemical Systems, LLC	Supporting Organization	Industry	Newton, Massachusetts



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Massachusetts

Project Transitions



February 2009: Project Start



May 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.2 Electrochemical: Fuel Cells